

## 2. STORM WATER BEST MANAGEMENT PRACTICES

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### 2.1. INTRODUCTION

MDOT's storm water management program includes implementation of best management practices (BMPs) to comply with each of the minimum measures as stated in the Permit. BMPs include structural and nonstructural practices applied to the design, construction, operation and maintenance of MDOT's transportation infrastructure as well as organization/administrative processes. This chapter discusses each of these three categories of BMPs and describes interim milestones and measurable goals that meet the Permit requirements.

### 2.2. CATEGORIES OF BMPS

#### 2.2.1 *Structural BMPs*

Structural BMPs are physically constructed controls that may remove pollutants from runoff, limit the rate of runoff, prevent contact between runoff and pollutants, and stabilize pollutants. Structural BMPs include temporary and permanent BMPs. Some examples are listed here and the current list of all approved structural best management practices is included in Appendix D.

- Drop inlet sediment trap
- Geotextile silt fence
- Sediment basin
- Flow control structures

#### 2.2.2. *Nonstructural BMPs*

Nonstructural BMPs are preventative actions that involve managerial planning and source controls. Nonstructural BMPs are further divided into operational and vegetative BMPs. Some examples are listed here and the current list of all approved nonstructural best management practices is included in Appendix D.

##### **Operational BMPs**

- Minimizing effects of highway de-icing by ensuring the proper calibration of salt trucks and evaluating the environmental impact and feasibility of using alternative de-icing materials on roadways.
- Street sweeping to prevent sediment and other debris from entering storm water.
- Used oil recycling program for used oil generated by MDOT operations.
- SESC plan and field reviews to ensure that proper controls are designed, constructed and maintained on MDOT projects.

##### **Vegetative BMPs**

- Vegetated buffers at water courses to reduce soil erosion and sedimentation.
- Permanent/Temporary Seeding to stabilize flat areas and slopes.

### ***2.2.3 Organizational BMPs***

Organizational BMPs include actions taken by MDOT to provide leadership support and resources needed to meet the goals of this plan. Providing continued support for staff involvement on the MS4 Team; establishing consultant contracts to provide technical resources where necessary; establishing the Operations Environmental Stewardship Engineer position within the Bureau of Operations with primary responsibility for the Storm Water Management Program; and the management level Environmental Committee with its associated technical groups are examples of organizational BMPs. MDOT will continue to evaluate and adopt Organizational BMPs.

## **2.3 ORGANIZATIONAL BEST MANAGEMENT PRACTICES**

Organizational BMPs include changes made across the MDOT organization to foster awareness for storm water management concerns and to ensure that the Department continues to meet or exceed the conditions of the Permit. This SWMP represents an organizational BMP consisting of a four step process: Preparation and Ongoing Planning; Program Implementation; Assessment of Effectiveness; and Program Enhancement.

### ***2.3.1 Preparation and Ongoing Planning***

The first phase of the storm water management program cycle is identifying what changes are required within the MDOT organization, including revisions to MDOT manuals, contracts, operating procedures and other legal documents, to ensure compliance with the Permit. The MS4 Team has established several internal workgroups responsible for developing and implementing the plan changes required to comply with the Permit.

BMP Design and Maintenance Workgroup - This workgroup is responsible for developing procedures for:

- Selection, application, and maintenance of structural and nonstructural BMPs;
- Reviewing projects on which storm water discharges to water bodies having established TMDLs; and
- Tracking structural and nonstructural BMPs using the Maintenance Activity Reporting System (MARS).

MDEQ Early Coordination Workgroup - This workgroup is responsible for developing procedures for:

- Allowing MDEQ the opportunity to provide input on selected design projects including those discharging to TMDL water bodies; and
- Providing a mechanism to monitor and document results of the adopted process.

Road Maintenance Documentation and Tracking Workgroup - This workgroup is responsible for developing and implementing procedures for:

- Tracking road maintenance activities that may impact the Department's storm water management goals;
- Ensuring that Maintenance Superintendents and Supervisors are kept informed of new storm water management program requirements; and
- Exploring options for reviewing representative contract county PIPPs and roadway maintenance work as these relate to MDOT's permit.

Program Assessment and Reporting Workgroup - This workgroup is responsible for:

- Determining MDOT's existing infrastructure-related information tracking abilities;
- Evaluating ways to coordinate these with the storm water management plan data tracking requirements; and
- Assisting in the preparation of annual progress reports as required by the Permit.

### ***2.3.2. Program Implementation***

The second phase of the storm water management program cycle consists of initiating the SWMP activities developed or updated during the program planning phase. Lessons learned and measurable results of the SWMP are compiled during the program implementation phase.

### ***2.3.3. Assessment of Effectiveness***

The third phase of the storm water management program cycle involves an assessment of the plan and the overall program, including a discussion of strengths and weaknesses of BMPs, examination of survey results from training modules and analysis of operating procedures. All BMPs and related objectives and goals from Chapter 3 will be reviewed annually. The results of the annual assessment will be presented in the annual progress report required by the Permit. The report will describe the status of compliance with Permit requirements including a report of illicit discharges and illicit connections removed, an assessment of the appropriateness of BMPs, a report of the progress of achieving the identified interim milestones and measurable goals established for the cycle.

Updates to MDOT's SWMP may be distributed annually to MDOT SWMP holders as necessary in the form of replacement or supplemental pages. Modifications to the SWMP may include updated measurable goals and interim milestones, activities and procedures. A revised version of the entire SWMP may be drafted every three to five years.

### ***2.3.4. Program Enhancement***

The results of the effectiveness assessment will be used to identify opportunities for enhancing the program and to better define interim milestones and measurable goals. As new tools are developed for managing storm water discharges in accordance with the Permit, they will be incorporated into this plan, added to job-related training materials and implemented across the organization. Program enhancement details will be included in the annual reporting process.

## **2.4 STRUCTURAL AND NONSTRUCTURAL BMP ADOPTION PROCEDURE**

Structural, nonstructural-operational and nonstructural-vegetative BMPs that have been in use by MDOT for many years are detailed in the Maintenance Performance Guides, the Drainage Manual and the SESC Manual. These publications include guidance on the specific application, design and implementation of the BMPs.

In 1999, the department undertook an investigation of BMPs implemented by other departments of transportation to develop a benchmark against which to evaluate current and recommended BMPs at MDOT. The result was the development of a process by which MDOT will continue to assess appropriate BMPs, determine which may be applicable to each of the minimum measures

required by the Permit; and to document the overall effectiveness or environmental benefit for each practice within the constraints of the Permit.

The first step in the approval process is to determine what changes are needed and conduct the necessary research on the subject. Any MDOT employee may request that the MS4 Team evaluate a BMP. The MS4 Team will determine the appropriate area of responsibility within MDOT to evaluate the feasibility and effectiveness of the measure in meeting the goals of the storm water management program. The MS4 Team will assist with identifying the appropriate area of responsibility and will be responsible for advancing any BMP submitted from an outside agency.

Once submitted, the BMP will be reviewed by the appropriate environmental technical team and/or individual(s) with technical expertise in the area of responsibility. Field evaluation may be required and a pilot project may be undertaken to assist in the evaluation. If the BMP is found to represent a feasible practice for meeting the goals of the SWMP, the storm water program manager will request final approval by the Environmental Committee for incorporation of the new BMP. If changes are required in standard design, construction, operation or maintenance practices, the Environmental Committee will advance the proposed BMP to the Engineering Operations Committee for consideration and approval. As necessary, the various MDOT manuals, guides and specifications will be revised to incorporate newly adopted BMPs following the established schedule for review and update.

Once approved for implementation, selection of specific structural and nonstructural BMPs to cost-effectively reduce pollutant loadings on individual projects will follow procedures established in the Drainage Manual.

## **2.5 INTERIM MILESTONES, AND MEASURABLE GOALS**

Identification of interim milestones and measurable goals for program activities provides measurability and accountability within the program. Interim milestones and measurable goals have been established to demonstrate the environmental benefit of the overall MDOT storm water management program. Interim milestones for storm water management activities include identifying what information needs to be collected and the best format and mechanism for gathering the information across the organization and across the transportation network. As these interim milestones are reached, MDOT will build on the interim results to achieve the final measurable goals. MDOT understands that the final measurable goals for each of the plan elements may be revised or enhanced, as applicable, as part of the annual reporting process.

To provide a framework for activities, interim milestones and measurable goals, five output/outcome levels are discussed below. Outputs are reported through Level 1, numerical tracking, while outcomes are reported through interim milestones and measurable goals within the remaining levels. See Chapter 3 for details on SWMP activities, interim milestones and measurable goals.

**2.5.1 Numerical Tracking (Level 1)** - Activities conducted under this level generally include those that are specifically described or required in the Permit. MDOT will be conducting a number of activities appropriate for numerical tracking such as the number of storm water

education packets distributed to the general public, the number of attendees at training sessions, and the number of structural and nonstructural BMPs installed. Outputs from numerical tracking will be reported as part of the annual reporting requirements of the Permit.

**2.5.2. *Changes in Knowledge/Awareness (Level 2)*** - Changes in knowledge and awareness will be achieved through continued training and exposure to environmental stewardship concepts. MDOT has developed and implemented a multi-faceted training program targeted to specific audiences within the job-related public. This training provides information and knowledge necessary to ensure compliance with MDOT's storm water management plan. Once information is provided and the level of understanding of MDOT's environmental stewardship role is increased, behavioral changes will be evident through compliance with new programs and Permit requirements. MDOT will conduct periodic surveys of MDOT and the job-related public to gauge the effectiveness of the program.

**2.5.3. *BMP Implementation and Load Reductions (Level 3)*** - Structural and nonstructural BMPs are designed to reduce the amount of pollutants entering local water bodies from storm water runoff. MDOT currently tracks the installation and location of structural and nonstructural BMPs and will evaluate the long term effectiveness of these measures. The feasibility of using the information gathered to perform theoretical calculations of pollutant load reduction will be evaluated during the first three years of the permit cycle. Results will be analyzed during year four for consideration for inclusion in the SWMP update in year five. See Activity C-1, Activity C-3, and Activity C-6 in Chapter 3 for more detailed information on BMP evaluation.

**2.5.4. *Changes in Discharge Quality (Level 4)*** - While MDOT's permit does not require monitoring wet weather discharges, results from MDOT's Illicit Discharge Elimination Program (IDEP) will serve as a means of showing changes in discharge quality. The IDEP as presented in Chapter 3 includes monitoring discharges at locations where illicit connections are suspected. Results will be compiled and reported as part of the annual reporting requirements of the Permit.

**2.5.5. *Changes in Receiving Water Quality (Level 5)*** - Although the ultimate goal of NPDES storm water regulations is to improve water quality of receiving water bodies, documenting this improvement as a result of actions taken by MDOT is difficult if not impossible. The storm water that drains off of highways is only a small portion of impervious land area contained within a typical watershed. MDOT is not required to conduct receiving water quality monitoring, but will cooperate with regional planning groups in areas with impaired water bodies, consistent with requirements of the Permit.

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